

NAMI-GrowTech

GrowSeal™ Nano-modified Waterproofing Coating for Versatile Application

Norman CHANG, GrowTech Limited

Xinkun LU, Nano and Advanced Materials Institute Limited



Outline

GrowSeal™

- ❑ Background-Waterproofing Problems Around Us
- ❑ Nano-modified Penetrating Cementitious Crystalline Waterproof Primer
- ❑ Nano-modified Polymer Cementitious Waterproof Coating
- ❑ Design of a Nano-driven Waterproofing System
- ❑ Concluding Remarks



Problems: Water Seepage Around Us

GrowSeal™

- Seepage from roof



Carpark Ceiling

• Damage of Waterproofing Membrane

Ceiling





Problems: Water Leakage Around Us

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- Leakage from the external wall



- Leakage from the water tank





Problems: Failure of Waterproofing Materials Applications

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Air bubbles
(Uprising moisture)



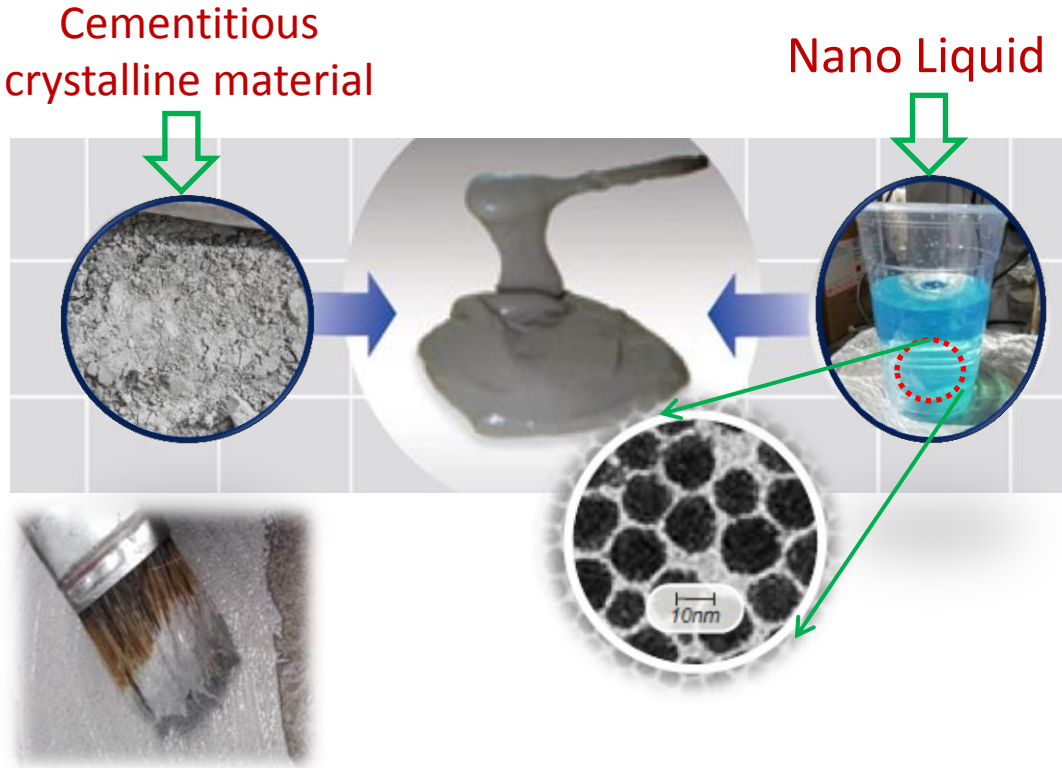
Dusty surface



Our Solution: Nano-modified Penetrating Cementitious Crystalline Waterproof Primer

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Nano-modified Cementitious Crystalline Waterproofing primer



The developed nano-modified cementitious crystalline waterproofing primer (nano-primer) was comprised of cementitious crystalline powder and Nano liquid.



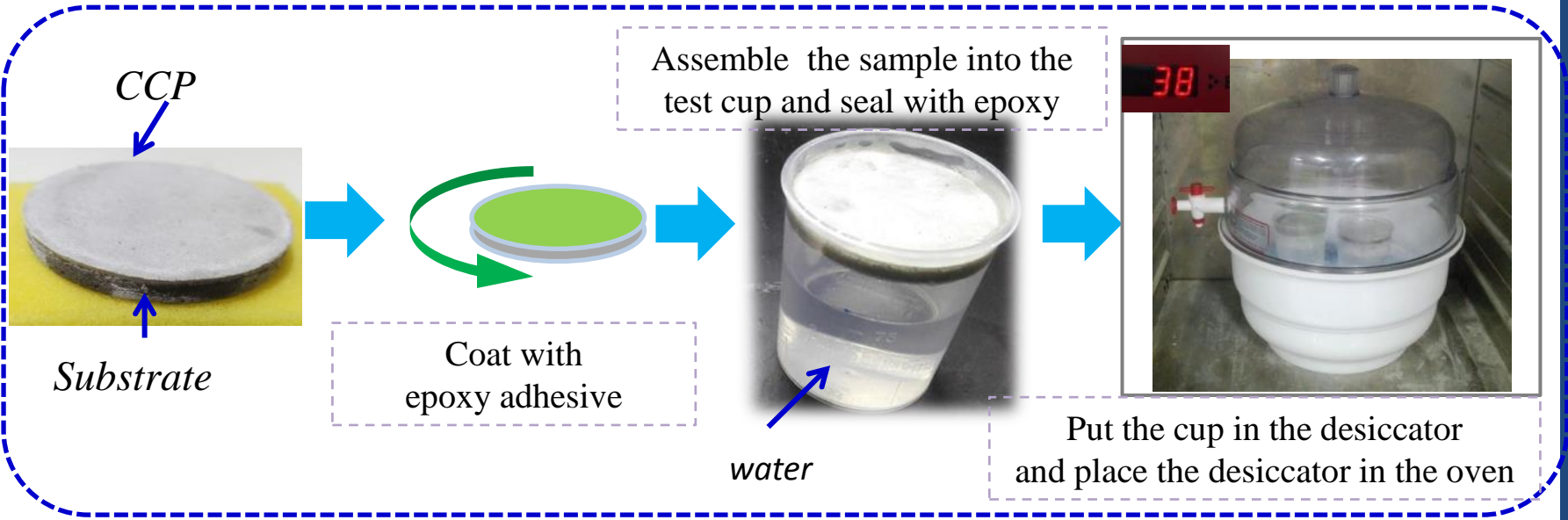
Performance: Resistance against Water Vapor



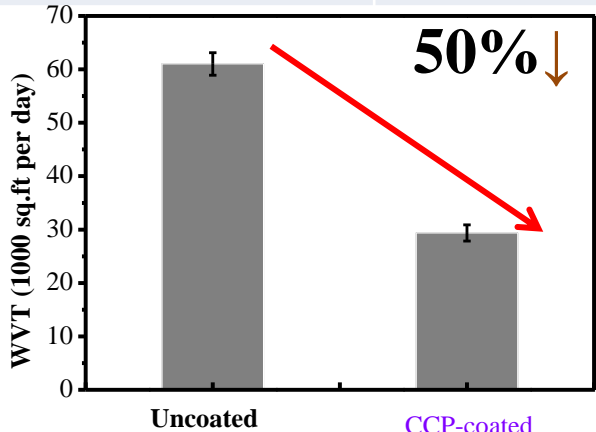
Vapor

Good Water Vapor Resistance

ASTM E96



Samples	WVT(g/h.m ²)	WVT (pound/(day.1000ft ²))
GrowSeal™ CCP	7.11±0.31	36.26±0.41

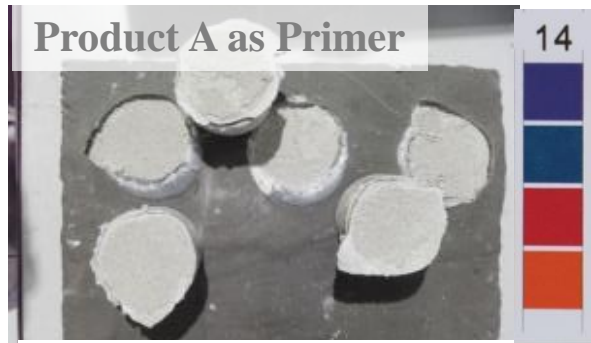




Performance: Bonding Strength

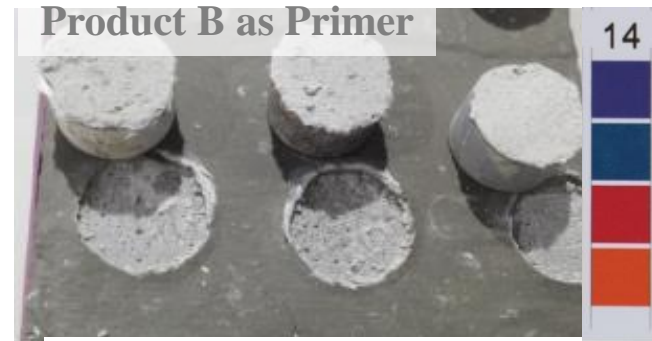
GrowSeal™

Lower alkaline corrosion & Good compatibility



Bonding: ~0.1MPa

High pH value of Product A



Bonding: ~0.7 MPa

High pH value of Product B

GrowSeal™ CCP Primer



Bonding: **>1.2MPa**
Lower pH value of
GrowSeal™ CCP

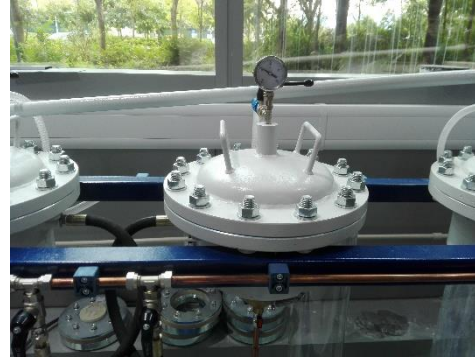
- ❑ GrowSeal™ CCP primer has lower alkaline corrosion and good compatibility with top polymer cementitious waterproofing coating.



Performance: Waterproofing

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Waterproofing against **Negative Pressure** 1.4 MPa for 14 days



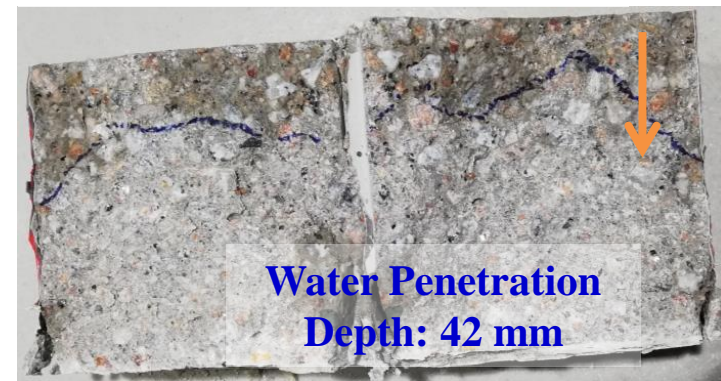
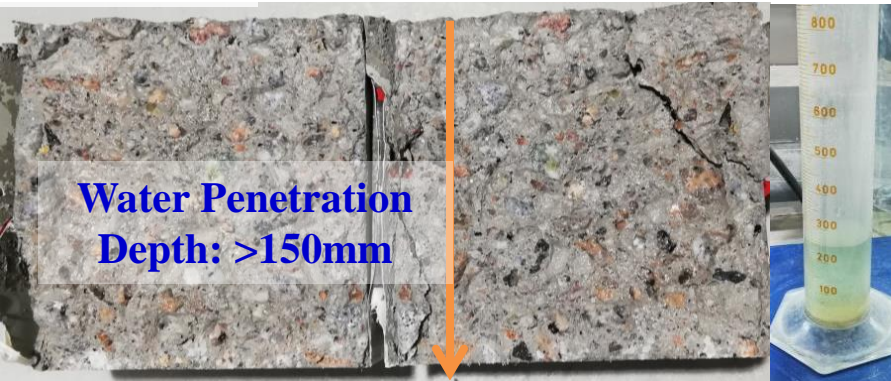
U.S. Army Corps of Engineers CRD C48



Automatic concrete water permeability apparatus

Uncoated

GrowSeal™ CCP Primer



- Control had an water permeability of **200 ml**, while nano-primer treated sample **0 ml**. GrowSeal™ CCP has excellent waterproofing which can resist 140m hydrostatic **negative pressure**.

Excellent Waterproofing

Your Materials Expert

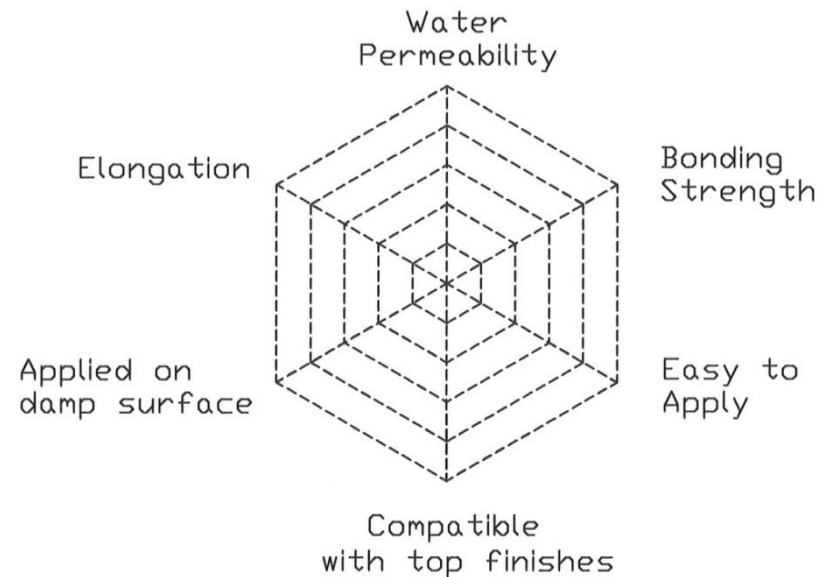
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Major Requirement for Choosing Liquid Applied Waterproofing Material on Concrete Surface in Humid Environment

GrowSeal™

1. **Waterpermeability – waterproofing**
2. **Elongation – cater for further crack development**
3. **Bonding Strength – adhesion on concrete surface**
4. **Applied on damp surface – suitability on humid weather**
5. **Easy to apply – without using special & heavy machine & tools**
6. **Compatible with top finishes – final finishes (e.g. plaster, tiles, paint, etc.) can be easily applied on the top.**

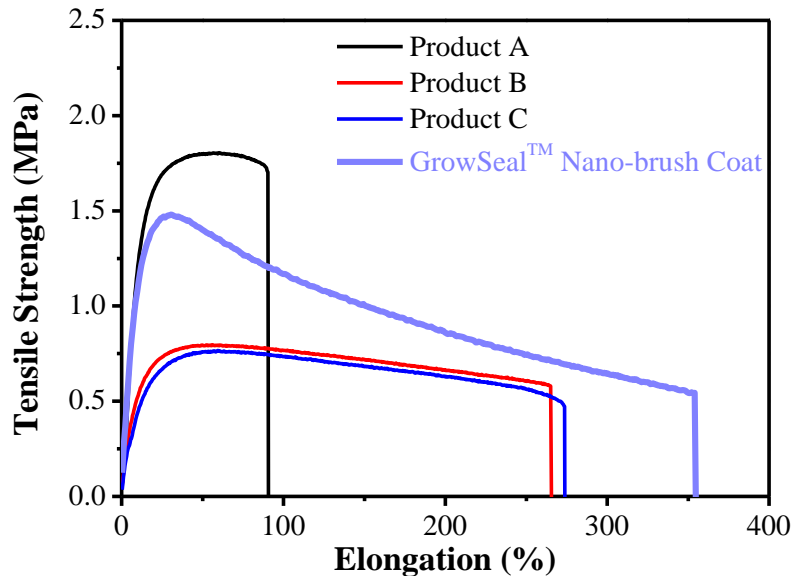




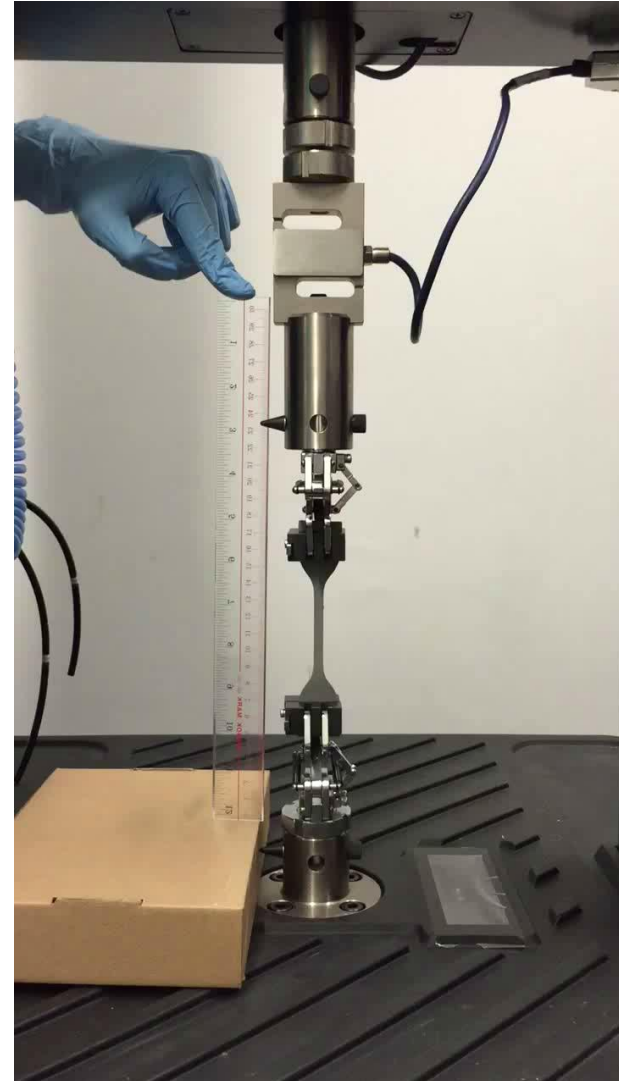
Nano-brush Coat: Elongation

- ◆ High flexibility with > 300% elongation value.

The incorporation of nanoparticles promotes a new load transferring mechanism in achieving high flexibility with good tensile strength, and thus covers minor cracks caused by various reasons.



Tensile curve of one coating specimen under tensile testing condition.

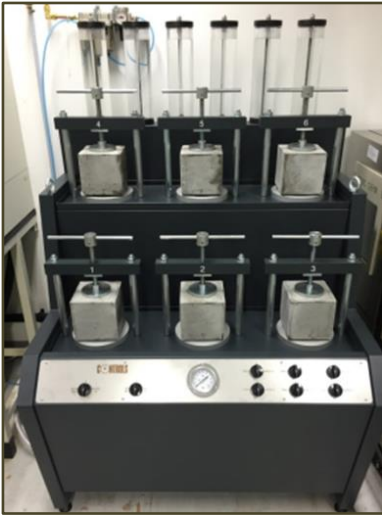




Nano-brush Coat: Waterproofing

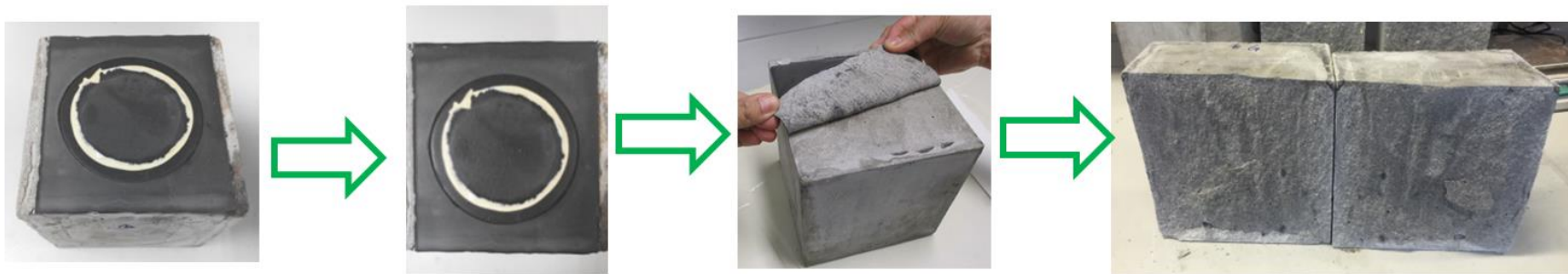
GrowSeal™

- ◆ Superior waterproofing performance (**No water leakage with 0 mm water penetration under 5 Bar Pressure over 72 Hours**).



The incorporation of nanoparticles can enhance the waterproofing capability of the coating, accompanied with filling and sealing the pores of the surface covered and thus resisting hydrostatic pressure.

Water permeability apparatus



Investigation of depth of water penetration under 5 Bar water pressure for 72 hours. No water penetration was found.

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Nano-brush Coat: Other Features

GrowSeal™

- ◆ Low VOC
- ◆ Easy Application (Applied with a Brush, Roller or Spraying Method).

The two-component cementitious coating materials can be easily mixed by using a common site mixer. The mixed coating materials can be applied to damp surface of freshly placed concrete in new construction or restoration sites.



Award Winning Technology



Unique Nano Cementitious Waterproofing Material – 45th International Exhibitions of Geneva 2017 ~ Silver Medal

Applications



Swimming Pool



Toilets



External Wall



Flat Roof



Planter



Water Tank

Project	Treated Area (Approx.)	Year
Waterproofing work for Walk-in Chiller Room at 1/F, Nam Pak Hong Building	80 sq.m.	2019
Waterproofing work for Swimming Pool, 146 Waterloo Road	160 sq.m.	2019
Waterproofing work for Podium 386 Castle Peak Road, Ting Kau	100 sq.m.	2019
Waterproofing work for F.S. Tank at Lamma Power Station Extension	70 sq.m.	2018
Waterproofing work for 310 – 310C Un Chau Street	2500 sq.m.	2018
Waterproofing work for bathroom, water tank, flat roof, external wall at 361 – 365 Queen's Road West	2800 sq.m.	2018
Waterproofing work for bathroom, flat roof at 68 Portland Street	1200 sq.m.	2018
Waterproofing work for flat roof at 12 Broom Road	267 sq.m.	2018
Waterproofing work for roof, Flat 6A, Blk 1, Parc Versailles	110 sq.m.	2018
Waterproofing work for external wall, 2 MacDonnell Road	270 sq.m.	2017 – 2018
Waterproofing work for roof, Nam Pak Hong Building	50 sq.m.	2017
Waterproofing work for Marketplace by Jason at Olympian City 2	300 sq.m.	2017
Waterproofing work for flat roof, 6 Tung Shan Terrace	70 sq.m.	2017
Waterproofing work for podium, 3/F, 130 – 142 Johnston Road	160 sq.m.	2017
Waterproofing work for flat roof, 115 How Ming Street	70 sq.m.	2017

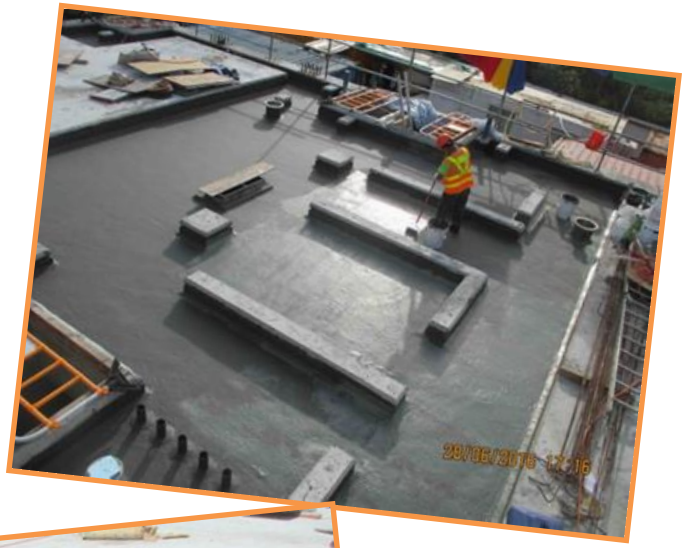
Job References

Waterproofing work flat roof and planters at Building 1, 2 & 3, Organic Waste Treatment Facilities, Phase 1, Siu Ho Wan	6000 sq.m.	2016 – 2017
Waterproofing work for flat roof & water tanks at Tsung Tsai Yuen, Tai Po	300 sq.m.	2016
Waterproofing work for flat roof & external walls at 73 Perkins Road	500 sq.m.	2016
Waterproofing work for flat roof at Blk. B, Hamilton Court, 8 Po Shan Road	200 sq.m.	2016
Waterproofing work for flat roof, balcony & external walls at House E, Habitat, Sai Kung	100 sq.m.	2016
Waterproofing work for Seafood & Bakery Counters at Wellcome Supermarket, 1/F Liberte Shopping Centre	23 sq.m.	2016

M Nano-brush Coat: Application Examples

GrowSeal™

Project Reference



- Project** : Building 1, 2 & 3, Organic Waste Treatment Facilities Phase 1, Siu Ho Wan, Hong Kong
- Product** : Growseal™ Nano-brush Coat nano-modified superior waterproofing coating
- Application area** : Flat roofs & planters
- Quantity** : Approx. 6000 sq.m.
- Year** : 2016 - 2017

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Nano-brush Coat: Application Examples

GrowSeal™



Project Reference

- Project** : 73 Perkins Road, Hong Kong
- Product** : Growseal™ Nano-brush Coat nano-modified superior waterproofing coating
- Application area** : Flat roof & external walls
- Quantity** : Approx. 500 sq.m.
- Year** : 2016

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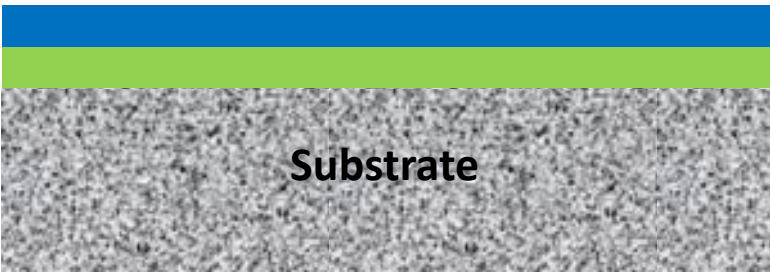


Nano-driven Waterproofing System

GrowSeal™

A durable nano-driven double protection waterproof system was developed by integrating nano-modified penetrating cementitious crystalline waterproof primer with nano-brush coat.

Nano-brush Coat



Substrate

Cementitious crystalline waterproof primer (CCP)



Rolling



Brushing

Application areas:



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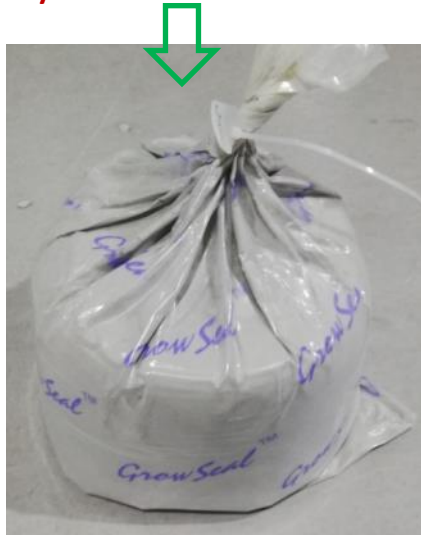


Re-industrialization at Hong Kong

GrowSeal™

GrowSeal™ CCP Nano-modified Penetrating Cementitious Crystalline Waterproof Primer

Cementitious crystalline material



15kg/Pack

Nano Liquid



6kg/Pack



GrowSeal™ CCP

Mixing of nano-primer



Up now, over **1.5 tons** of **GrowSeal™ CCP primer** have been manufactured and applied in Hong Kong since May 2019.



Nano-driven Waterproof System in Action at Hong Kong

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Applications



Internal side of external wall



Ceiling



Basement Wall



Lift Pit



Nano-driven Waterproofing System: Applications

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Job References



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Concluding Remarks

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□ *Nano-modified cementitious crystalline waterproofing primer*

- ✓ *Good micro-cracks sealing;*
- ✓ *Good water vapor resistance;*
- ✓ *Good chloride resistance;*
- ✓ *Good waterproofing against positive/negative pressure;*
- ✓ *Good compatibility with top waterproofing coatings;*
- ✓ *Strong adhesion to wet substrate & top waterproofing coating*

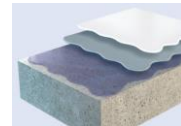
□ *Nano-modified polymer cementitious waterproofing coating*

- ✓ *Superior elongation ($\geq 300\%$)*
- ✓ *Enhanced bonding on concrete*
- ✓ *Excellent water permeability resistance*



□ *Nano-driven Waterproofing System*

- ✓ *Nano-modified primer (resistance to negative water pressure) + Nano-flexible cementitious coating (resistance to positive water pressure)*
- ✓ *Enhanced bonding on concrete*
- ✓ *Excellent water permeability resistance*





Thank You!

